PCT WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 5 : B41F 31/02 — A1

(11) International Publication Number: WO 93/24328

(43) International Publication Date: 9 December 1993 (09.12.93)

(21) International Application Number: PCT/SE93/00447

(22) International Filing Date: 19 May 1993 (19.05.93)

(30) Priority data:
9201610-4 22 May 1992 (22.05.92) SE

(71)(72) Applicants and Inventors: BÖÖSE, Åke [SE/SE]; Laxvägen 3, S-181 30 Lidingö (SE). STENQVIST, Jan [SE/SE]; Mosshult 3580, S-260 60 Kvidinge (SE).

(74) Agent: AWAPATENT AB; Box 5117, S-200 71 Malmö (SE).

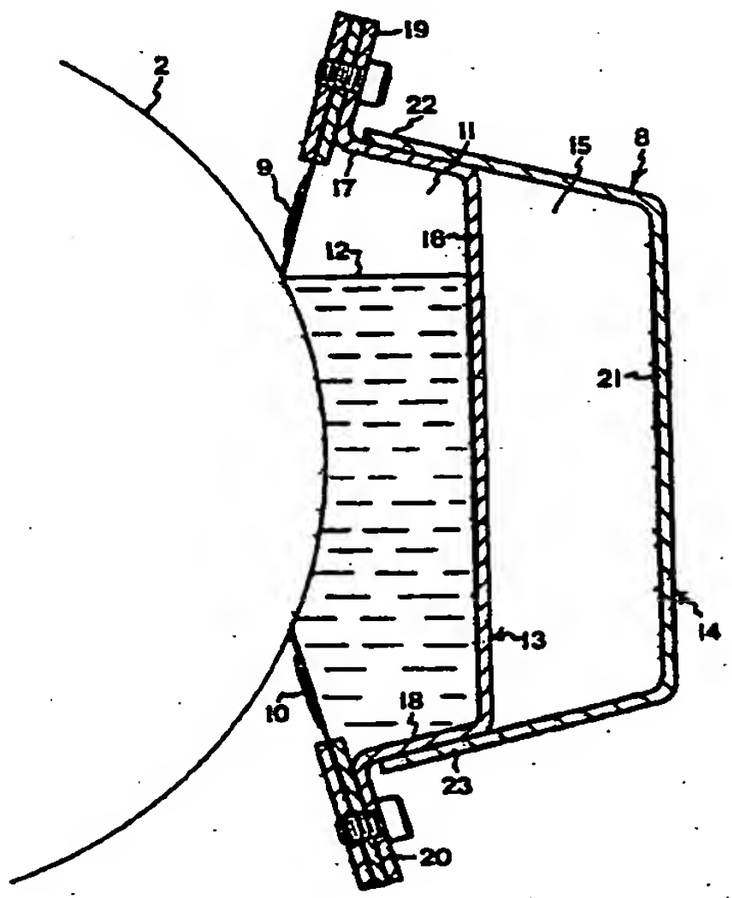
(81) Designated States: AT, AU, BB, BG, BR, CA, CH, CZ, DE, DK, ES, FI, GB, HU, JP, KP, KR, KZ, LK, LU, MG, MN, MW, NL, NO, NZ, PL, PT, RO, RU, SD, SE, SK, UA, US, VN, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).

Published
With international search report.
In English translation (filed in Swedish).

(54) Title: CHAMBERED DOCTOR BLADE DEVICE FOR PRINTING UNIT, AND PRINTING UNIT

(57) Abstract

A chambered doctor blade device intended for a printing unit and adapted to coat a rotatable cylinder (2) with ink, comprises an elongate frame (8) which is arranged parallel to and outside the cylinder (2) and on which are mounted two parallel, elongate and spaced-apart doctor blades (9, 10) to be resiliently and scrapingly applied against the cylinder (2) in operative position. An elongate chamber (11) holding ink (12) is defined by the doctor blades (9, 10), the surface of the frame (8) facing the cylinder (2), and the circumferential surface of the cylinder (2). To achieve good flexural and torsional rigidity, the frame (8) comprises at least two elongate interconnected metal sections (13, 14) which are made of bent thin sheet-metal, preferably of stainless steel, and by means of which the elongate portion of the frame (8) located between the mounting places for the doctor blades (9, 10) forms an elongate stiffening or reinforcing portion. Such a frame (8) ensures, in operation, a set constant distance between the frame (8) and the cylinder (2) and, consequently, constant application of the doctor blades (9, 10) against the cylinder (2).



FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AT	Austria	FR	France	MR	Mauritania
AU	Australia	GA	Gabon	MW	Malawi
BB	Barbados	GB	United Kingdom	NL	Netherlands
BE	Belgium	GN	Guinea	NO	Norway
BF	Burkina Faso	GR	Greece	NZ	New Zealand
BG	Bulgaria	HU	Hungary	PL	Poland
BJ	Benin	IE	Ireland	PT	Portugal
BR	Brazil	IT	Italy	RO	Romania
CA	Canada	JP	Japan	RU	Russian Federation
CF	Central African Republic	KP	Democratic People's Republic of Korea	SD	Sudan
CG	Congo			SE	Sweden
CH	Switzerland	KR	Republic of Korea	SK	Slovak Republic
CI	Côte d'Ivoire	KZ	Kazakhstan	SN	Senegal
CM	Cameroon	LI	Liechtenstein	SU	Soviet Union
CS	Czechoslovakia	LK	Sri Lanka	TD	Chad
CZ	Czech Republic	LU	Luxembourg	TG	Togo
DE	Germany	MC	Monaco	UA	Ukraine
DK	Denmark	MG	Madagascar	US	United States of America
ES	Spain	ML	Mali	VN	Viet Nam
FI	Finland	MN	Mongolia		

Chambered doctor blade device for printing unit, and printing unit.

FIELD OF THE INVENTION

This invention relates to a chambered doctor blade device, in the following also referred to as chambered doctor blade, for a printing unit. More precisely, the invention concerns a chambered doctor blade of the type defined in the preamble to appended claim 1. In addition, the invention relates to a printing unit equipped with such a chambered doctor blade.

BACKGROUND OF THE INVENTION

Chambered doctor blades are extensively used in rotary-printing units, especially flexo-printing units, for applying ink, lacquer, adhesive or the like to a rotatable cylinder included in the printing unit. In a flexo-printing unit, the chambered doctor blade serves to ink the screen roller, i.e. fill the cells or recesses of the roller with printing ink. The inking of the screen roller is essential for the printing result. It is of special importance that the screen roller is uniformly inked, which means that the distance between the roller and the doctor blades have to be accurately set. As a result, the chambered doctor blade, usually clamped in the machine frame of the printing unit, has to exhibit good flexural and torsional rigidity.

Prior-art chambered doctor blades therefore comprise a sturdy frame, which usually is solid and made in one piece and on which the doctor blades are mounted. EP-A-0 350 839 and WO-A-89/07047, for instance, teach chambered doctor blades of this type.

Conventionally, such doctor blade frames are made of solid cast iron or aluminium, or compression-moulded blanks of iron or aluminium provided with stiffening springs to reduce their weight. However, these known constructions suffer from some serious drawbacks. First, the chambered doctor blade becomes very heavy and unwieldy and is thus difficult to dismount from the printing unit, e.g.

when to be cleaned or replaced. It usually takes two people to dismount a cast-iron chambered doctor blade. Second, one casting mould is needed for each length of chambered doctor blade. Third, the cast-iron structure naturally is liable to corrosion, which constitutes a serious inconvenience, since the printing ink to be circulated in the chamber often contains corrosive components.

The market also provides doctor blade frames consisting of extruded aluminum sections in one piece, but these do not offer any satisfactory solution to the above problems. If to withstand the contemplated strains and to obtain sufficient flexural and torsional rigidity, the aluminium sections have to be comparatively thick, and the chambered doctor blade will thus after all become unnecessarily heavy. Furthermore, also the aluminum sections are liable to corrosion, since the printing ink often contains basic substances aggressive on aluminium.

In addition to the requirements discussed in the foregoing, the ink chamber naturally has to be sealed. The doctor blade that removes excess ink, for the contemplated direction of rotation of the roller, is the operative doctor blade, and the other doctor blade merely has a sealing function. When the direction of rotation is reversed, it naturally is the other way round. The two doctor blades have to be applied against the circumferential surface of the screen roller in precisely the right way for the ink to be evenly distributed on the roller and to minimise the amount of ink dripping from the lower doctor blade (when being the sealing one). Moreover, special seals are required at each end of the chamber. In this respect, reference is made to US-A-4,581,995, which teaches a sealing unit placed at the end of an ink chamber and consisting of a pressure and labyrinth seal made up of several thin sealing lamellae of polymeric material.

OBJECTS OF THE INVENTION

One object of this invention is to provide a chambered doctor blade device that, despite its low weight, has sufficient flexural and torsional rigidity to ensure that a rotating cylinder is evenly coated with ink or the like.

Another object of the invention is to provide a chambered doctor blade device that is easy to clean and maintain, especially when it comes to replacing the seals.

A further object of the invention is to provide a chambered doctor blade device that is not liable to corrosion from the liquid, e.g. printing ink, held in the chamber.

Yet another object of the invention is to provide a chambered doctor blade device that, when suitably sealed, enables a controllable liquid flow in the chamber as well as a constant level of liquid therein and that limits the total volume of liquid needed in the circulation system.

A special object of the invention is to provide a chambered doctor blade device that is made up of few components and thus is simple and inexpensive to produce.

SUMMARY OF THE INVENTION

These and other objects, apparent from the following description, are achieved by a chambered doctor blade device which is of the type stated by way of introduction and which in addition exhibits the features recited in the characterising clause of appended claim 1. Preferred embodiments of the inventive chambered doctor blade device are defined in appended subclaims 2-10. An inventive printing unit is defined in appended claim 11.

The invention is based on the idea of the frame of the chambered doctor blade being, in order to achieve a good stiffening and reinforcing effect, composed of an assembly of interconnected metal sections. According to the main idea of the invention, the frame composed of metal sections should form a flexurally and torsionally rigid unit which ensures a constant distance between the

frame and the cylinder against which the doctor blades are to be applied, thereby to attain the objects of the invention.

By designing the frame in this way, the whole chambered doctor blade can be of much lighter and more slender construction than possible hitherto, without lowering the standards of strength.

DESCRIPTION OF THE DRAWINGS

The invention and its many advantages will be described in more detail below with reference to the accompanying drawings showing, by way of example only, a currently preferred embodiment of an inventive chambered doctor blade. In the drawings,

Fig. 1 is a schematic cross-section of a chambered doctor blade device according to the invention;

Fig. 2 is a part-sectional top view showing the chambered doctor blade device mounted in a printing unit;

Fig. 3 is an elevational view from behind of the chambered doctor blade device shown in Fig. 2;

Figs 4 and 5 are side views showing the chambered doctor blade device of Figs 2 and 3 in, respectively, operative position and inoperative position;

Fig. 6 is a slightly enlarged, schematic cross-section of the chambered doctor blade device of Figs 4 and 5;

Fig. 7 is a schematic longitudinal section of the chambered doctor blade device; and

Fig. 8 is an enlarged view of a part of Fig. 7.

DESCRIPTION OF A PREFERRED EMBODIMENT

In the drawings, a chambered doctor blade device, here also referred to as chambered doctor blade, is generally designated 1. The chambered doctor blade 1 is intended for use in a printing unit, such as a rotary-printing unit, especially a flexo-printing unit, where a rotatable cylinder 2, especially a screen roller, is to be coated with ink, lacquer, adhesive or the like. By means of a special suspension element 3, the chambered doctor blade 1 is mounted in the machine frame of the printing

unit. In the drawings, the machine frame is in the form of two side members 4 and 5, which in known manner are provided with guides 6, 7 for moving the chambered doctor blade 1 in relation to the cylinder 2 (see Fig. 2).

As shown most clearly in Fig. 1, the chambered doctor blade 1 comprises a frame, generally designated 8, on which two elongate doctor blades 9, 10 are mounted. The doctor blades 9, 10 are adapted to be resiliently and wipingly applied against the cylinder 2 in operative position. In this position, the doctor blades 9, 10 define, together with the surface of the frame 8 facing the cylinder 2 and the circumferential surface of the cylinder 2, an elongate chamber 11 holding printing ink 12 to be applied to the rotating cylinder 2.

The elongate frame 8 is parallel to and located outside the cylinder 2. The two doctor blades 9, 10 are parallel to each other and to the cylinder 2.

To achieve good flexural and torsional rigidity, the frame 8 comprises at leas two elongate, interconnected metal sections 13, 14 made of bent thin sheet-metal, preferably of stainless steel. The elongate portion of the frame 8 located between the mounting places for the doctor blades 9, 10 will thus form an elongate stiffening or reinforcing structure, and the frame 8 will thus constitute a flexurally and torsionally rigid unit which in operation ensures a set constant distance between the frame 8 and the cylinder 2 and, consequently, constant application of the doctor blades 9, 10 against the circumferential surface of the cylinder 2. As a result, the metal sections 13, 14 together form a closed hollow section having an elongate channel 15 between them, to be described further below.

The first metal section 13 of the frame 8, which is located closest to the cylinder 2, has a substantially U-shaped cross-section comprising a web 16 and two flanges 17, 18 which are directed towards the cylinder 2 and which

in turn have mounting flanges 19, 20 on which the doctor blades 9, 10 are detachably mounted.

The second metal section 14 of the frame 8, which is located outside the first metal section 13 with respect to the cylinder 2, also has a U-shaped cross-section comprising a web 21 which is parallel to and located at a distance from the web 16 of the first metal section 13, as well as flanges 22, 23 connected to the flanges 17, 18 of the first metal section to form the above-mentioned hollow section with the elongate channel 15 defined between the webs 16, 21 of the metal sections 13, 14. Preferably, the metal sections 13, 14 are interconnected by their respective flanges 17, 22 and 18, 23 being glued together and spot welded. However, it will be appreciated that the two metal sections 13, 14 may be interconnected in some other way.

The frame 8 composed of two metal sections 13, 14 thus assumes the shape of a hollow section, resulting in a lightweight frame 8 of excellent flexural and torsional rigidity. This slender, yet strong frame 8 has considerable advantages as compared with similar prior-art chambered doctor blades, discussed by way of introduction. The light frame 8 makes the inventive chambered doctor blade 1 very easy to handle, e.g when to be dismounted.

Tests have shown that a frame 8 composed of metal sections 13, 14 made of thin sheet-metal approximately 1-3 mm thick gives excellent results. However, the invention is not restricted to any particular type of thin sheet-metal. However, thin sheet-metal of stainless steel is advantageously used to avoid corrosion.

As shown in Fig. 2, the chambered doctor blade 1 is attached, by bolt joints 24 and 25, to the suspension element 3 mounted in the machine frame 4, 5. The suspension element 3 has means for parallel adjustment of the frame 8 in relation to the cylinder 2 as well as angular adjustment of the frame 8 with a view to changing the application of the doctor blades 9, 10 against the cylinder 2.

The adjusting means are illustrated in Figs 2 and 3. A first lever 26 is articulated to a tube 27 on the same side as a pivot pin 28 and the guide 7. The connection to the guide 7 is achieved by a bolt 29, and a second lever 30 is fixedly connected to the tube 27. An assembly 31 made up of a screw, a nut and a spring makes it possible to alter the angle between the levers 26 and 30, thereby altering the application pressure of the doctor blades 9, 10 against the cylinder 2. The pressure on the upper doctor blade 9 is either increased or decreased, and vice versa, for the lower doctor blade 10.

At the other end, the suspension element 3 comprises a bolt 32 and a pivot pin 33 surrounded by an eccentric sleeve 34 inside the tube 27. The eccentric sleeve 34 can be rotated about the pivot pin 33 and be locked in relation thereto by a screw 35. The arrangement also includes springs 36 (see Figs 4 and 5) intended to push the guides 6, 7 forwards towards the cylinder 2, as is schematically illustrated by arrows in Fig. 2. This movement is limited by adjusting screws 37 (see Fig. 3). By these screws, the distance and the parallelism between the cylinder 2 and the doctor blades 9, 10 are set in the x-z plane. The positions of the doctor blades 9, 10 in the y-z plane are adjusted by the eccentric sleeve 34.

If the spring action exerted by the springs 36 is relieved, the chambered doctor blade 1 can be moved back away from the cylinder 2. If, in this removed position, the connection between the lever 26 and the guide 7 is released, the suspension element 3, and thus the whole chambered doctor blade 1, can be pivoted about the pivot pins 28, 33, as shown in Figs 4 and 5. Thus, the chambered doctor blade 1 is easily inspected and the doctor blades 9, 10 are easily cleaned in a service position. By a suitable choice of mounting points in the machine frame, the chambered doctor blade 1 can be locked in the desired position. The mounting of the chambered doctor blade 1 is

schematically illustrated in Figs 4 and 5 and generally designated 8.

Many parameters can be altered by the adjusting means 24-38 described in the foregoing, whereby to achieve much simpler and more accurate adjustment of the chambered doctor blade 1 in relation to the cylinder 2 than has hitherto been possible by known adjusting means.

Reference is now made to Fig. 6, which illustrates a circulation system for the ink 12 with which the cylinder 2 is to be coated. The frame 8 of the chambered doctor blade 1 is enclosed in a cover comprising a collecting drain 39 with an inclined flange 40 disposed below the lower doctor blade 10. The flange 40 collects any ink that may drip from the lower doctor blade 10. The ink is pumped from an ink container 41 and through an inlet 42 into the chamber 11 of the chambered doctor blade 1. At each end, the chamber 11 is closed by an end cover 43, 44 (see Fig. 7). Each end cover 43, 44 has an overflow port 45 where excess ink flows out of the chamber 11 to be collected in the collecting drain 39. The ink is recycled to the container 41 through an outlet 46 of the collecting drain 39 (see Fig. 3). This circulation system ensures a controlled ink flow in which the total amount of ink can be limited. This is a considerable advantage, the price of printing ink having increased considerably in recent years. Also, spillage is much reduced by the provision of the collecting drain 39 with the associated drip-collecting flange 40.

Furthermore, it is essential to be able to control the level of liquid in the chamber 11, which is easily done by displacing the ports 45 of the end covers 43, 44 (not shown).

Thus, it is important to minimise the total amount of ink to be supplied to the circulation system of the chambered doctor blade 1 for filling the chamber 11. The collecting drain 39 should be relatively narrow and be provided adjacent to the chamber 11.

When printing limited editions, the inking system in conventional chambered doctor blades requires a large amount of ink to enable efficient printing, as compared with the amount of ink actually used in printing. To reduce the circulated amount of ink in the printing of limited editions, the container 41 can be dispensed with, and return ink may instead be pumped directly from the outlet 46 to the inlet 42.

As mentioned by way of introduction, it is of the utmost importance that the chamber 11 is suitably sealed. For this purpose, the end covers 43, 44 are equipped with an internal elastic seal 47 (see Fig. 8) which is sealingly applied against the inside of the inner metal section 13, the circumferential surface of the roller 2 and the insides of the doctor blades 9, 10.

The seal 47 ensures that the level of liquid in the chamber 11 is sufficiently high. For satisfactory operation, this level should be so high that the entire portion of the cylinder 2 located between the doctor blades 9, 10 is covered with ink (see Fig. 1).

The circumferential portion of the seal 47, preferably made of teflon, is directed inwards towards the chamber 11. In tests, this arrangement has been found to be satisfactory. As appears from Fig. 8, the chamber 11 is widened at the ends by the inner metal section 13 being so designed at the ends that the distance to the circumferential surface of the cylinder 2 increases, thereby giving the chamber 11 a larger cross-sectional area at the two end portions than at the central portion (cf. Fig. 7). This design results in an improved liquid flow at the ends of the chamber 11, while at the same time the main part of the chamber 11 can be extremely narrow, which considerably reduces the volume of ink. Another advantage is that the bent circumferential portion of the teflon seal 47 may extend a distance into the chamber 11, where it is worn in use. This bent portion increases the lifespan of the seal 47, since the seal does not have to be replaced until the

entire circumferential portion has been worn down. When the seal 47 is to be replaced, the removable end cover 43 is axially pulled off from the frame 8.

As indicated earlier, the flanges 17, 22 and 18, 23 of the metal sections 13 and 14, respectively, are sealingly interconnected in the longitudinal direction so as to form the longitudinal channel 15 in the frame 8. As shown in Fig. 7, the channel 15 is sealed at both ends to form a hermetically sealed compartment. Because the frame 8 thus assumes the shape of a closed hollow section, the compartment in the channel 15 never comes into contact with the printing ink or the surrounding atmosphere.

This compartment can be utilised by placing transducers 48 for inducing high-frequency sound inside the channel 15. In Fig. 7, there are shown three transducers 48, which preferably are glued onto the web 16 of the metal section 13 which is closest to the cylinder 2 inside the channel 15. The transducers 48 are connected to a high-frequency generator (not shown). When the generator is switched on, the ink in the chamber 11 is caused to oscillate at the same frequency as the transducers 48, which has been found to be extremely advantageous. First, the filling of the cells of the cylinder or screen roller 2 is improved to a certain extent because the ink 12, oscillating at a high frequency, eliminates or at least considerably reduces the risk of air gaps forming at the bottom of the cells emptied when ink was transferred to the printing block (not shown). Second, the ink 12, oscillating at a high frequency, entrains any ink that has dried in the cells of the screen roller 2, thereby improving the capacity of the roller 2 to entrain ink. Third, air from cells in the screen roller 2 emptied of ink is largely prevented from entering the chamber 11 to be admixed to the ink 12. Such admixture of air is disadvantageous, since it may considerably alter the viscosity of the ink 12.

When manufacturing the frame 8, the transducers 48 are glued onto the dry side of the first metal section 13, whereupon the second metal section 14 is connected thereto. The sealed frame 8 holding the transducers 48 thus forms a sealed cavity making it possible to arrange the required electrical connections (not shown) outside the danger zone for explosions of the printing unit. The size of this zone varies according to the amount of solvent in the printing ink.

Furthermore, the chambered doctor blade 1 can be used also in inflammable environments, because the transducers 48 are mounted inside the hermetically sealed channel 15 of the frame 8. Thus, any sparks generated cannot cause a fire.

It is particularly advantageous that the entire chambered doctor blade 1, after being dismounted, can be immersed in a cleaner bath (not shown) and washed by the transducers 48 being caused to oscillate by means of the high-frequency generator. Being fixed directly on the dry side of the metal section 13 communicating with the ink chamber 11, the oscillating transducers 48 can act precisely where the ink is to be removed in cleaning.

A further advantage is that the oscillating chambered doctor blade immersed in the cleaner bath helps to clean also other objects in the bath, e.g. blocks and end seals.

DESCRIPTION OF FURTHER EMBODIMENTS

In an inventive embodiment, not shown or described in detail here, use is made of another assembly of interconnected metal sections. In this case, the second metal section 14 of the frame 8 is replaced with an elongate tubular metal element which, by throughgoing mounting screws, is attached to a first section corresponding to the U-section 13. The mounting screws extend right through the tubular section, through a hole in the inner section, and are finally screwed into counterplates arranged on the inside of the inner section. If need be, spacer plates further stiffening the arrangement can be

provided between the tubular section and the inner U-section. Such a frame has been found to possess excellent stiffening properties.

Finally, it should be pointed out that the invention is by no means restricted to the embodiments described in the foregoing, and several modifications are thus conceivable within the scope of the invention as defined in the appended claims. For instance, the metal sections of the frame can be otherwise designed, provided that the required stiffening or reinforcing effect as well as the flexural and torsional rigidity are achieved. Naturally, the frame may be composed of more than two metal sections. Although the invention is especially applicable to the coating of a screen roller with ink, it may also be used for applying lacquer, adhesive or the like on some other type of cylinder.

CLAIMS

1. A chambered doctor blade device for printing units, which is adapted to apply ink (12), lacquer, adhesive or the like to a rotatable cylinder (2) in the printing unit, especially a screen roller, and which comprises an elongate frame (8) which is arranged parallel to and outside the cylinder (2) and on which are mounted two parallel, elongate and spaced-apart doctor blades (9, 10) also disposed parallel to the cylinder (2) and arranged, in operative position, to be resiliently and wipingly applied against the cylinder (2), the doctor blades (9, 10), when in said operative position, defining, together with the surface of the frame (8) facing the cylinder (2) and the circumferential surface of the cylinder (2), an elongate chamber (11) holding the ink (12) or the like to be applied to the rotating cylinder (2), c h a r a c t e r i s e d in that the frame (8) comprises at least two elongate, interconnected metal sections (13, 14) by means of which the elongate portion of the frame (8) located between the mounting places for the doctor blades (9, 10) forms an elongate stiffening or reinforcing portion, such that the frame (8) constitutes a flexurally and torsionally rigid unit which in operation ensures a set constant distance between the frame (8) and the cylinder (2) and, consequently, constant application of the doctor blades (9, 10) against the circumferential surface of the cylinder (2).

2. A device as set forth in claim 1, in which the metal sections (13, 14) together form a closed hollow section.

3. A device as set forth in claim 2, in which the one metal section (13) of the frame (8) which is closest to the cylinder (2), has a substantially U-shaped cross-section comprising a web (16) located at a distance from the circumferential surface of the cylinder (2) as well

as two flanges (17, 18) directed towards the cylinder (2) and having mounting flanges (19, 20) on which the doctor blades (9, 10) are mounted, preferably detachably, the other metal section (14) of the frame (8) which is disposed outside the first metal section (13) with respect to the cylinder (2), also having a substantially U-shaped cross-section comprising a web (21) located at a distance from the web (16) of the first metal section (13) as well as flanges (22, 23) connected to the flanges (17, 18) of the first metal section (13) so as to form said hollow section with an elongate channel (15) defined between the webs (16, 21) of the metal sections (13, 14).

4. A device as set forth in claim 3, in which the flanges (17, 22 and 18, 23, respectively) of the U-shaped metal sections (13, 14) are sealingly interconnected in the longitudinal direction to form said channel (15), which in addition is sealed at each end to form a hermetically sealed compartment in the channel (15).

5. A device as set forth in any one of the preceding claims, in which the metal section (13) closest to the cylinder (2) is so designed at its ends that the distance to the circumferential surface of the cylinder (2) increases at said two ends, so that the chamber (11) has a larger cross-sectional area at the two end portions than at the central portion.

6. A device as set forth in any one of the preceding claims, in which the chamber (11) is closed at each end by a removable end cover (43, 44) having an internal elastic seal (47), preferably of teflon, which sealingly engages the inside of the metal section (13) located closest to the cylinder (2), the circumferential surface of the cylinder (2) and the inside of the doctor blades (9, 10).

7. A device as set forth in claim 6, which comprises an ink circulation system having an inlet (42) to the chamber (11), overflow ports (45) formed in the end covers

(43, 44), and a collecting drain (39) communicating with said ports and having an outlet (46) which, like the inlet (42), communicates with an ink container (41).

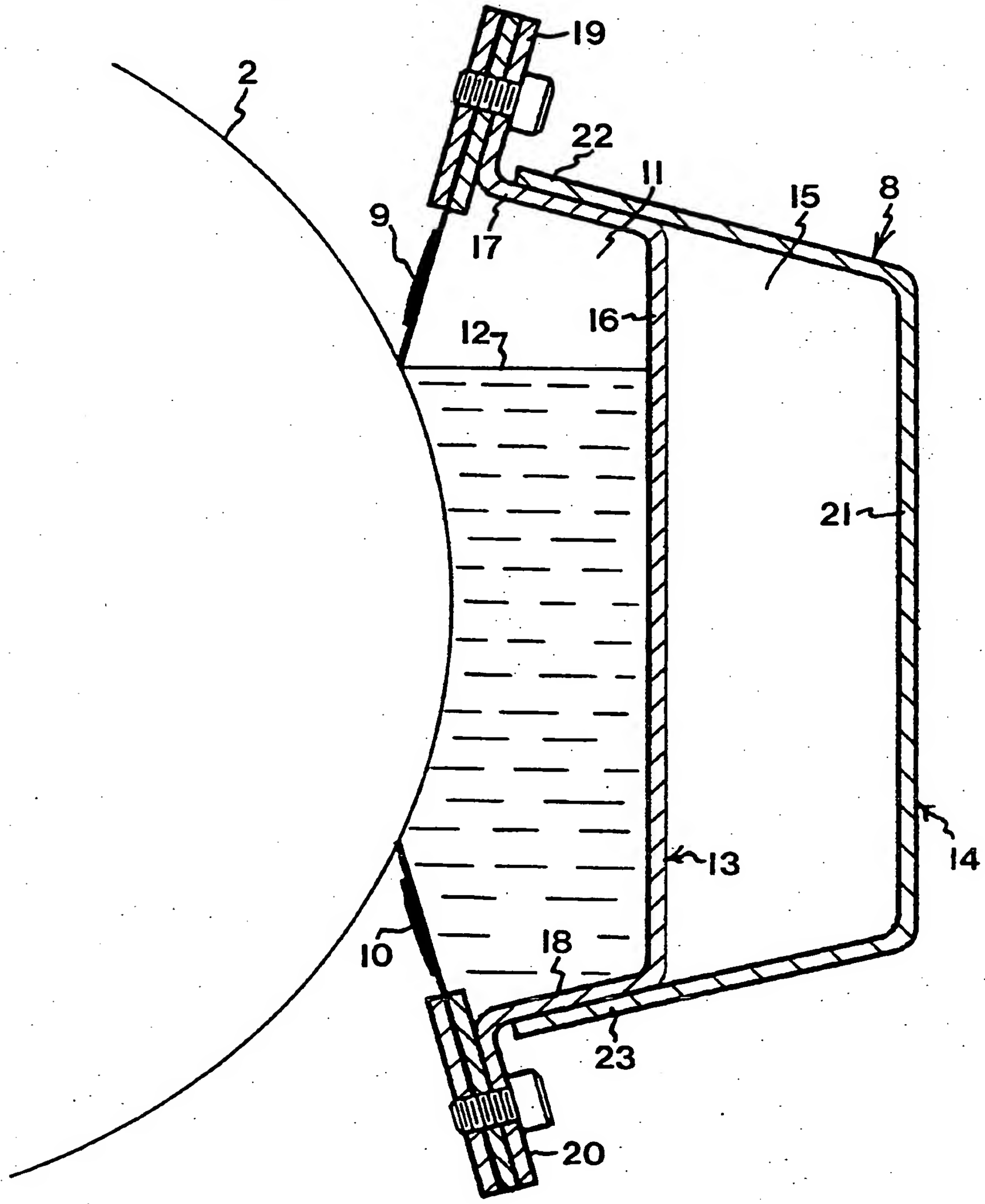
8. A device as set forth in any one of claims 2-7, in which transducers (48) for inducing high-frequency sound are arranged in the channel (15) of the hollow section and fixed, preferably by gluing, to the web (16) of the first metal section (13) located closest to the cylinder (2) adjacent to the chamber (11).

9. A device as set forth in any one of the preceding claims, which is pivotally mounted in the machine frame (4, 5) of the printing unit, such that the entire device (1) can be pivoted away from the cylinder (2) to an inoperative position.

10. A device as set forth in any one of the preceding claims, which is mounted in the machine frame (4, 5) of the printing unit by means of a suspension element (13) on which the frame (8) is mounted and which has means (24-38) for parallel adjustment of the frame (8) in relation to the cylinder (2) as well as angular adjustment of the frame (8) for changing the application of the doctor blades (9, 10) against the cylinder (2).

11. A printing unit, c h a r a c t e r i s e d in that it has a chambered doctor blade device (1) as set forth in any one of the preceding claims.

FIG.1



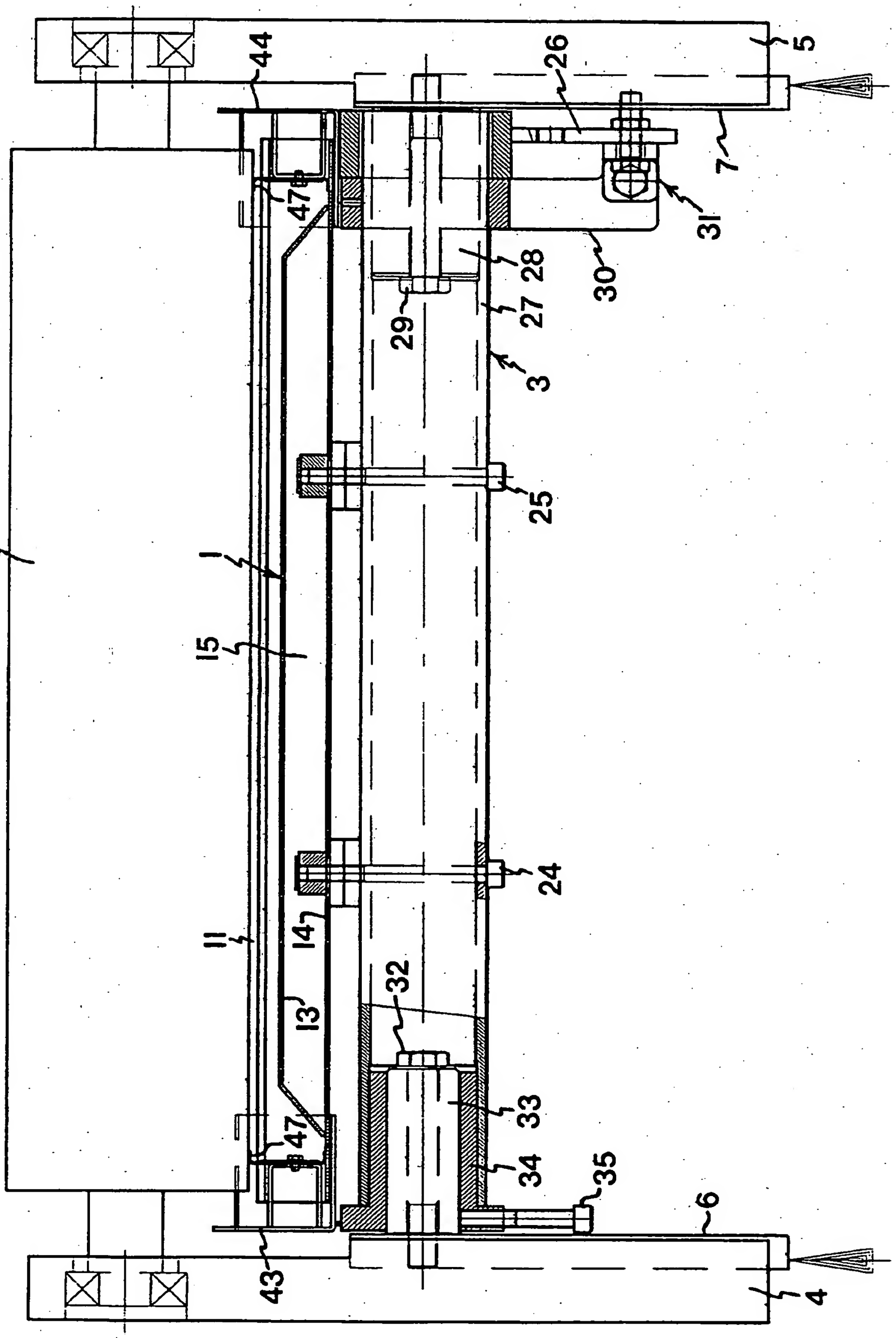


FIG.2

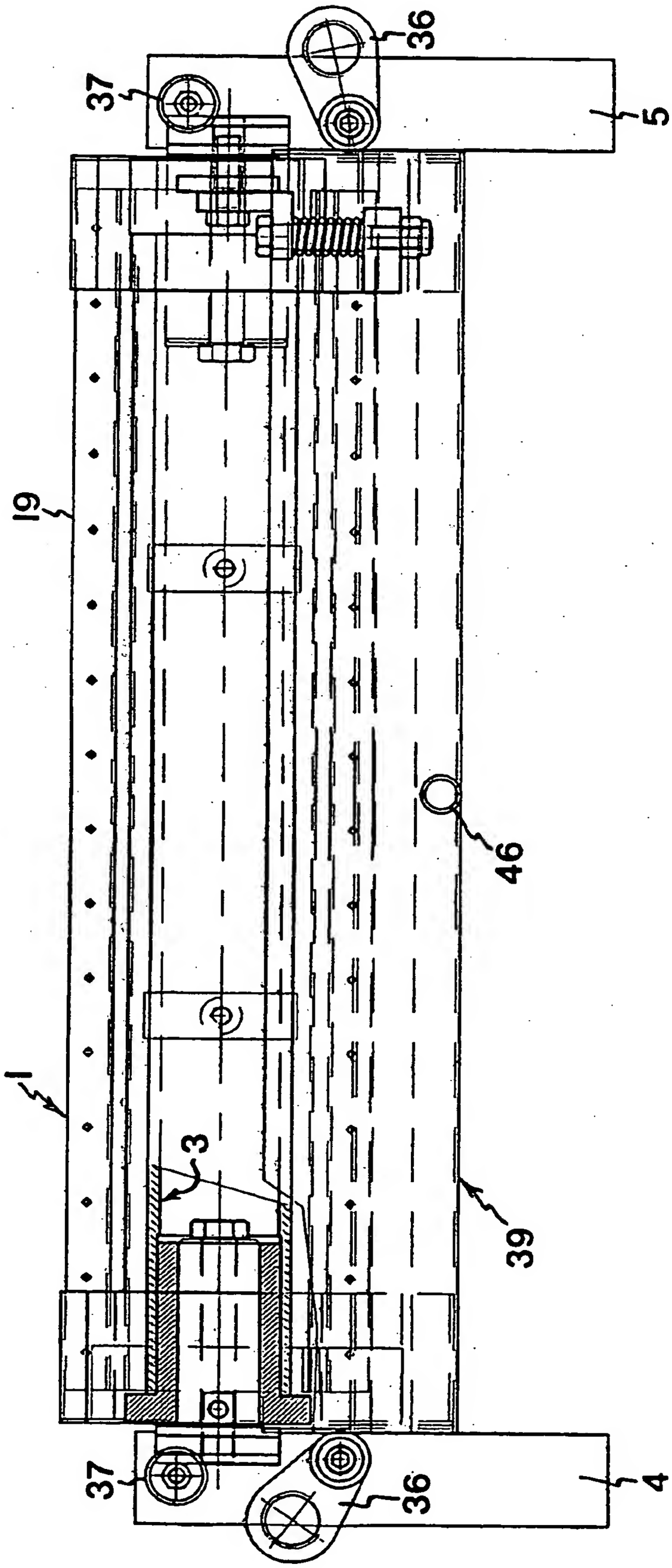


FIG.3

FIG.4

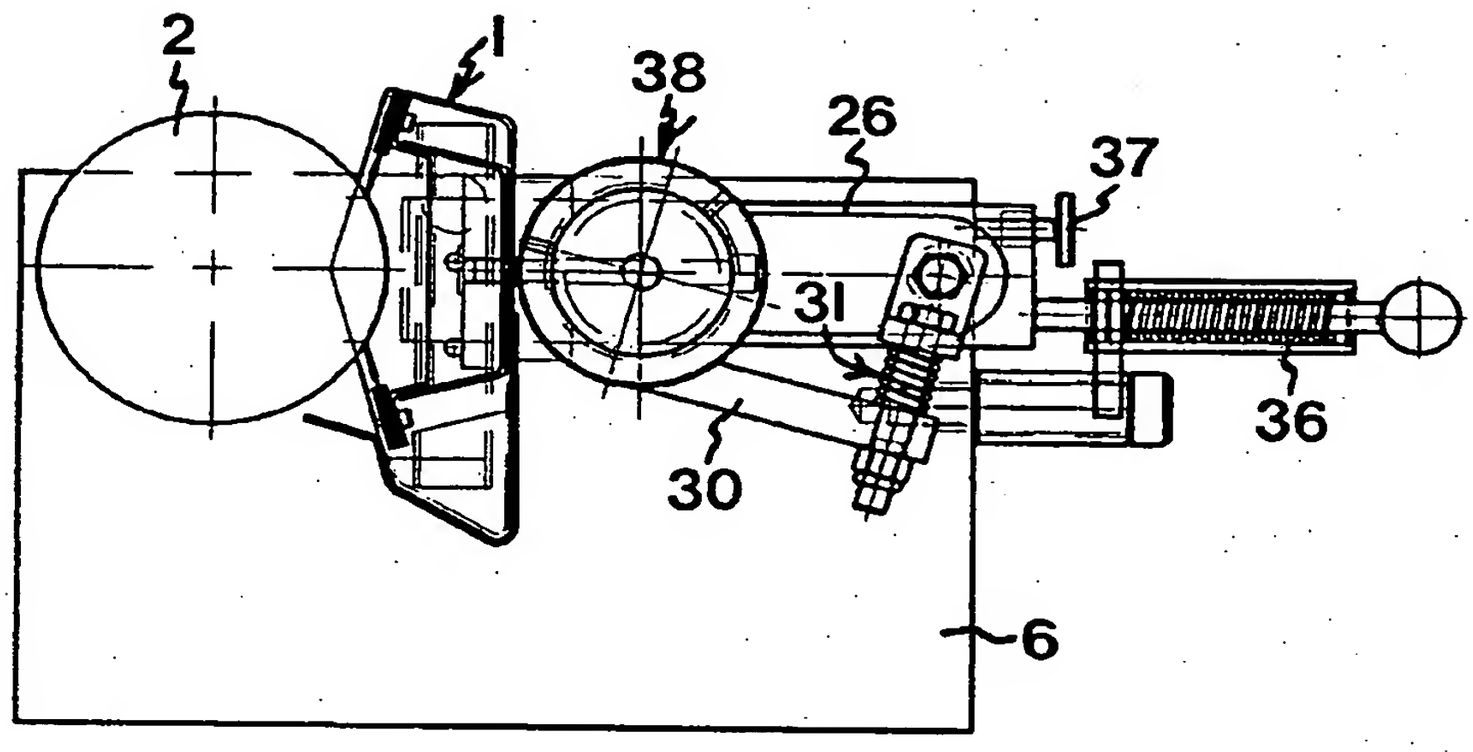
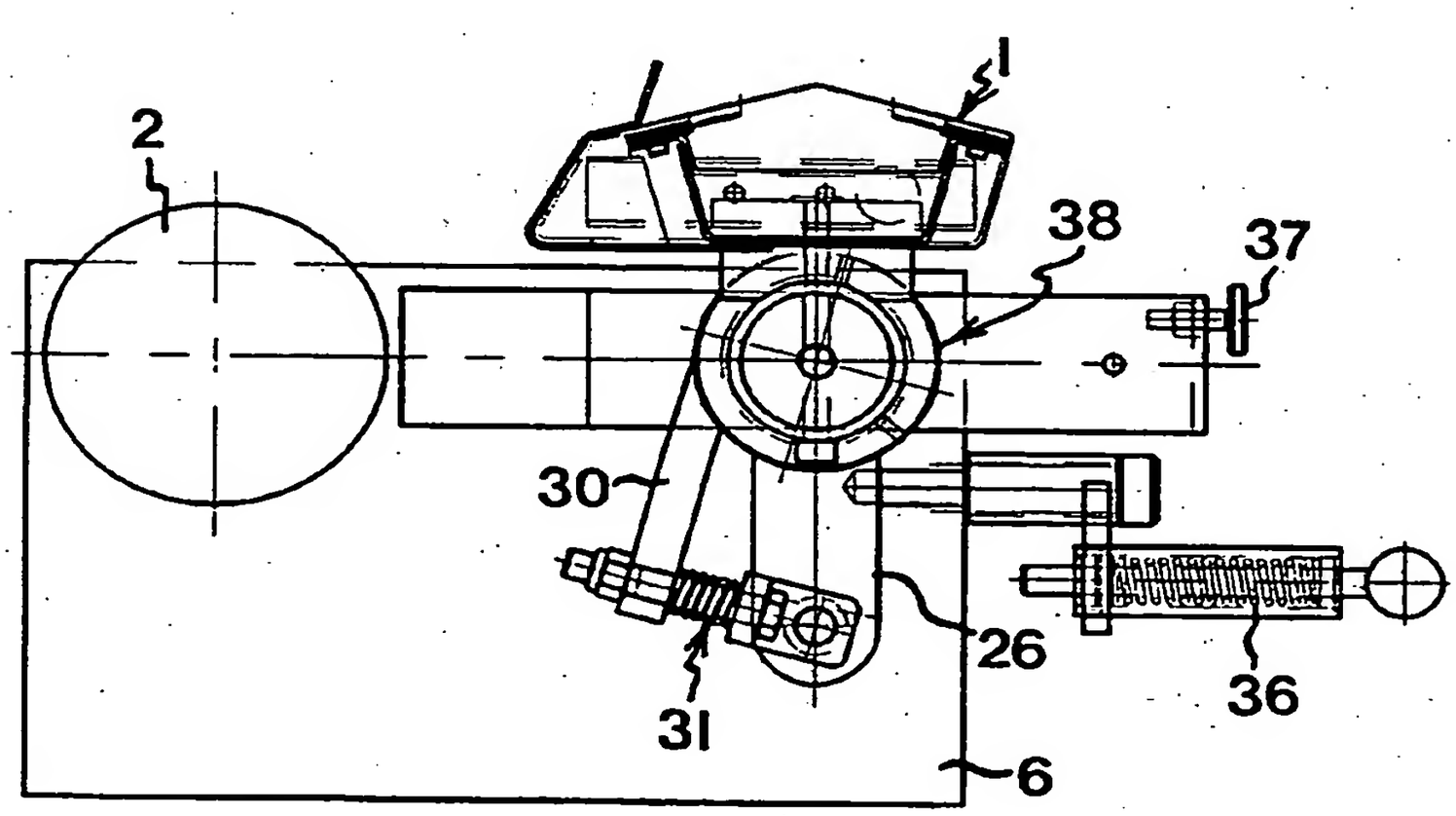


FIG.5



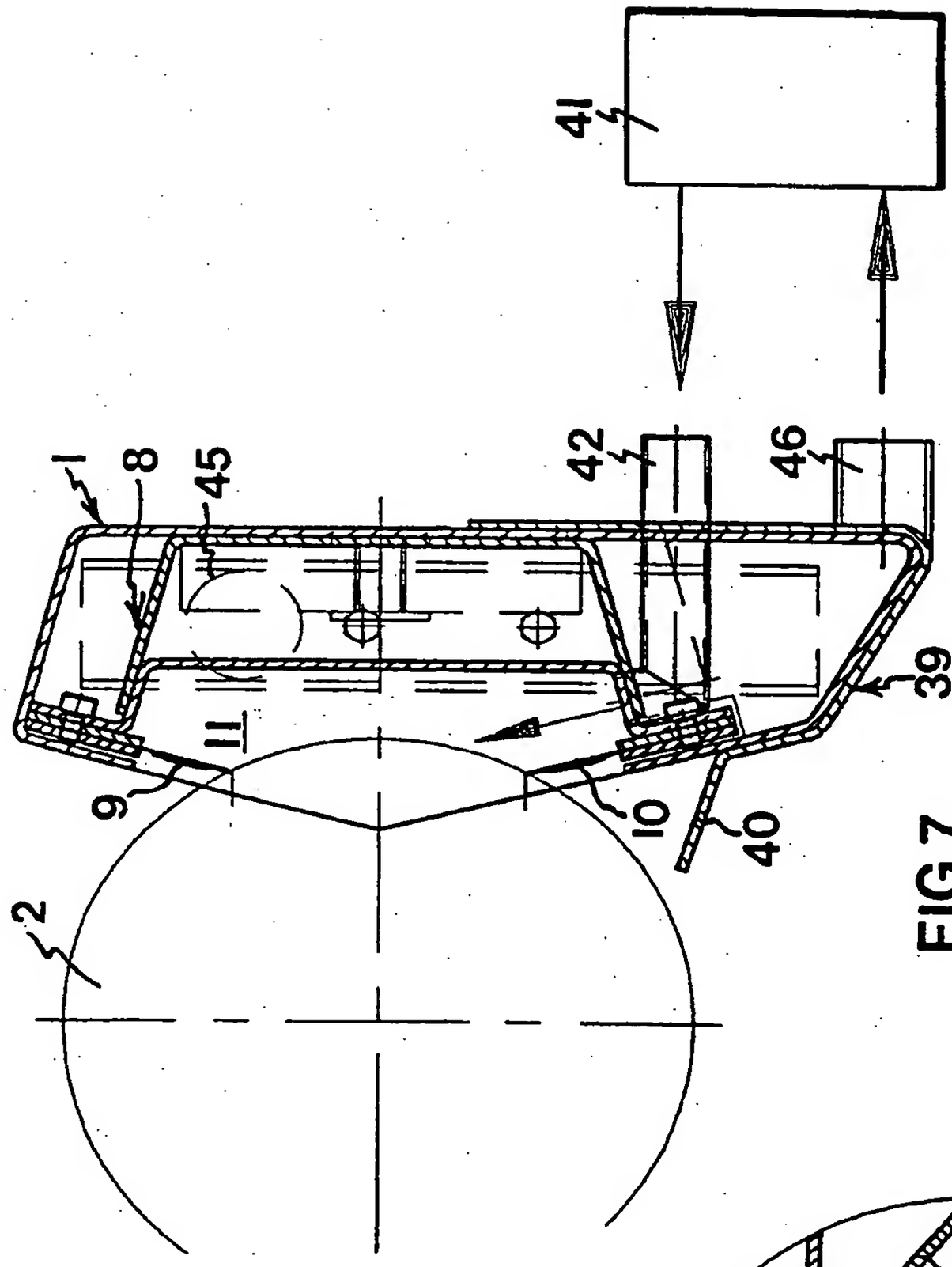


FIG.6

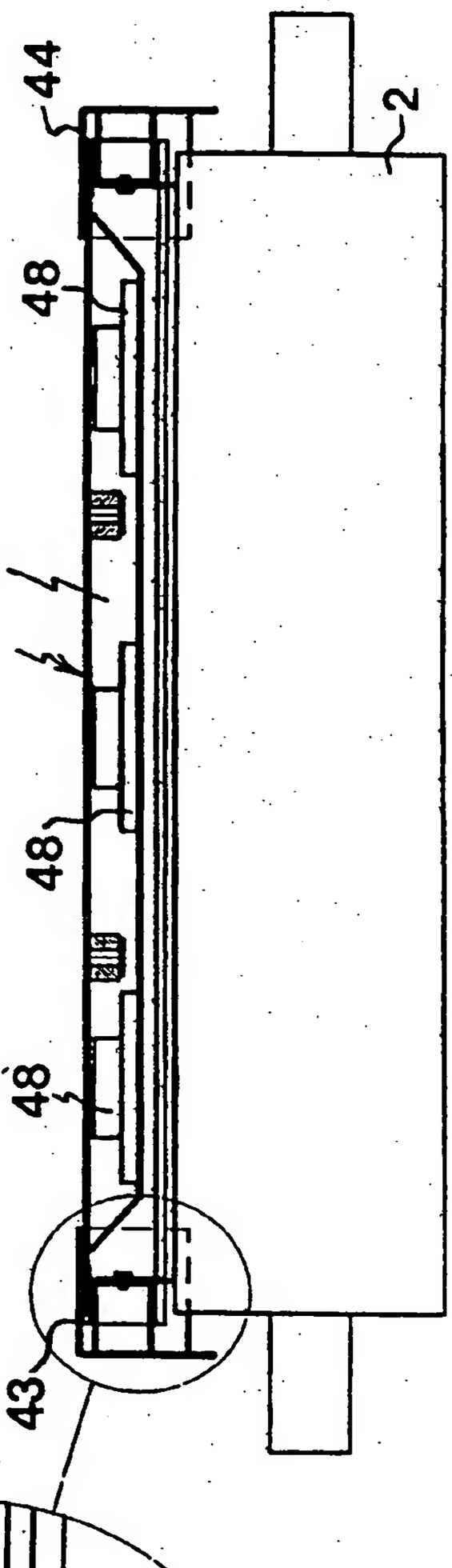


FIG.7

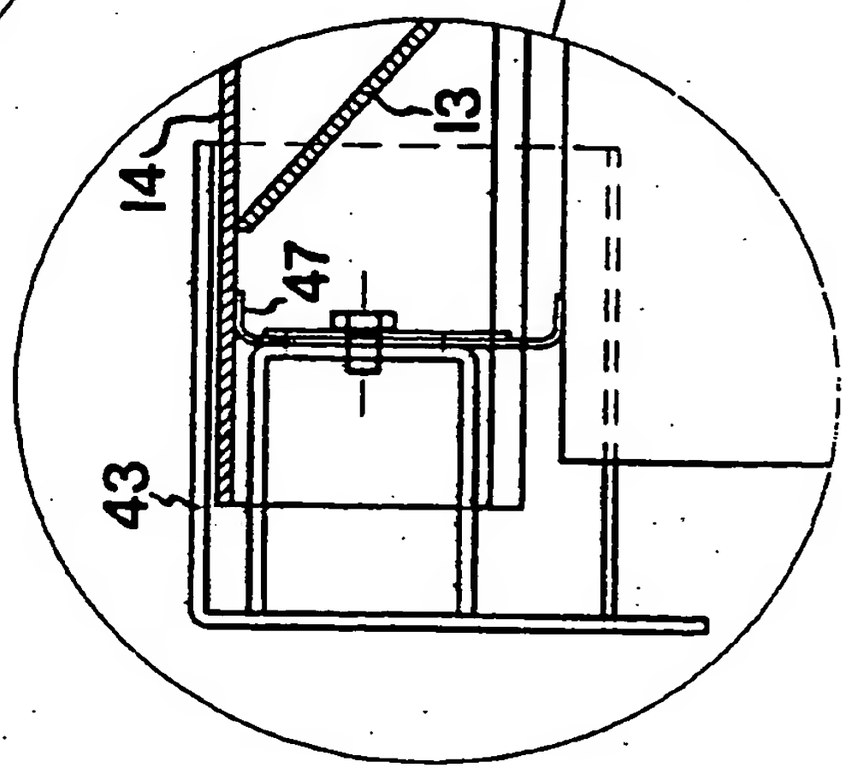


FIG.8